

Technology Center of DuPage

TECHNOLOGY CENTER OF DUPAGE (TCD)



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Technology Center of DuPage (TCD) is the Career and Technical Education (CTE) campus for 14 high school districts, including Lyons Township District 204. It is not a trade school or separate educational facility, but an elective component of LTHS curriculum for juniors and seniors. Recognized as one of the outstanding CTE programs in the nation, Technology Center of DuPage offers 20 programs within recognized Career Clusters. These programs are built around growing occupational fields, including those in engineering, health and safety services, and digital media. See www.tcdupage.org for complete information.

Because TCD is part of LT's course offerings, there is no tuition charge to attend. There is one modest participation fee for books, supplies, tools, or uniforms (exception: Cosmetology) for which the student is responsible – please see the TCD website for complete information. Students have the opportunity to earn both high school and college credit; obtain available industry certifications or licenses; and prepare for post-secondary education. TCD seniors will prepare for and take the National Career Readiness Certificate exam (NCRC), the national credential for workplace skills and applied academics (www.NationalCareerReadiness.org).

Construction / Natural Resources

Construction Trades

HVACR

Residential Wiring/Home Technology Integration

Horticulture/Power Equipment Technology

Art, A-V Technology & Communications

Multimedia & Television Production

Business Administration

Data Entry Occupations

Office Systems Technology

Education & Training

Early Childhood Education & Care

Health Science/Public Safety

Certified Nursing Assistant

Criminal Justice

Fire Science

Medical & Health Careers

Hospitality/Human Services

Cosmetology

Culinary, Pastry Arts & Hospitality

Information Technology

Computer Information Systems &

& Game Design

Manufacturing/Transportation

Auto Body Repair & Refinishing

Automotive Technology

Manufacturing Technology

Science, Technology, Engineering, & Math (STEM)

*"Pathway to Engineering" Courses (PLTW)**

*Introduction to Engineering Design (IED)**

*Principles of Engineering (POE)**

Biotechnical Engineering (BE)

*Aerospace Engineering (AE)**

*Civil Engineering & Architecture (CEA)**

*Computer Integrated Manufacturing (CIM)**

*Digital Electronics (DE)**

*Engineering Design & Development (EDD)**

**These programs are part of the Project Lead The Way (PLTW) Pathway to Engineering course sequence, including foundational courses (IED, POE), specialized courses (AE, BE, CEA, CIM, DE), and a capstone course (EDD). Each is a one semester course; up to four courses may be completed in a two-year enrollment.*

TCD Mission/Vision

Technology Center of DuPage will provide an educational environment that supports and encourages individual learning styles, develops occupational skills, fosters professionalism, promotes academic growth, and assists students in discovering their potential. All students attending Technology Center of DuPage will be prepared to successfully transition to post-secondary education and careers.

TCD General Information

The TCD campus is located in Addison, IL, approximately 30 minutes from LTHS North Campus. A student who enrolls in one of the programs attends TCD for three hours during the morning session each weekday and attends LT the other portion of the school day. Students earn 1.5 credits per semester and 3.0 credits per year. Programs/Courses are posted both in the Guide and on the TCD website: www.tcdupage.org. The most up-to-date course information is on the TCD web page. Information in The Guide is for planning purposes only.

A student who desires to enroll in a particular TCD program should review the course descriptions and LTHS pre-requisites and Lyons Township High School basic graduation requirements. Counselors will provide additional information and an application for enrollment at TCD.

There are deadlines to register for programs at TCD. A student who wishes to attend must turn in a completed application to his/her counselor one week in advance of the arena registration process. If the student's application is received after this deadline, his/her name will be placed on a waiting list. Students who do not meet this deadline or meet the prerequisites first semester, may enroll in a program at TCD during the second semester. Those students will be allowed to do so if they have completed an application and if there is available space.

Prerequisites

In general, juniors and seniors who have completed 2 years of English, Mathematics, and Science at LT are eligible for enrollment at TCD. A few programs have specific LT prerequisites which students must meet; others have suggested but not mandatory prerequisites. It is important for students and parents to consult each program's web page for syllabus information and academic recommendations. Most programs offer college credit, so are essentially a college level class.

College Credit through TCD Programs/Courses

Most TCD programs offer dual credit or articulated college credit. Dual credit means earning high school through TCD and free college credit simultaneously through College of DuPage. This credit appears on the student's high school transcript and is transferable to any school that accepts COD credit. Articulated credit is awarded after enrolling with a specific college or university, sometimes after successfully completing a test or other prerequisites.

Through TCD, students may:

- Reinforce academic skills through hands-on applications in a self-paced, goal-by-goal learning environment.
- Earn industry-recognized certifications or prepare for state, federal, professional, or national licensing exams.
- Create an effective résumé and workplace skills portfolio, valuable for applications or interviews for scholarships, colleges, or jobs.
- Build workplace skills and confidence through experience: job shadowing, internships, or TCD's own student-run shops and labs.
- Research the post-secondary educational options and scholarship opportunities; in the past four years, TCD seniors were awarded over \$1.3 million in scholarships.

What TCD Is and Is Not

TCD is not a separate educational institution, a trade school, or a college. It is part of LT's elective courses, and course offerings are supplemented to LT's curriculum. TCD has a strong academic focus on teaching basic principles of math, science, communications, and technology. However, TCD never underestimates the importance of real-world skills development in securing satisfying, well-paying employment. That's why TCD's unique combination of classroom instruction, career skills building, and hands-on experience is so effective in preparing you for today's high-performance workplace.

The Technology Center of DuPage is fully accredited by the North Central Association of Commission on Accreditation and School Improvement (NCA/CASI), a division of AdvancED. It is regarded as one of the Midwest's finest schools for career studies.

Participation Fee

The flat participation fee (\$100 for FY14; exception: Cosmetology) includes educational supplies, equipment, materials, and/or course book purchase or rental. Additional fees may include supplies purchased directly from a vendor or specialized curricula. See www.tcdupage.org for the latest and most complete information. In no case should a program fee prevent a student from enrolling in a Technology Center of DuPage program.

ARCHITECTURE/CONSTRUCTION

Construction Trades

Credit: 1.5 (Semester)	Level: III
3.0 (Annual)	
Grade Offered: 11, 12	Annual TC9280
	Fall TC9281
	Spring TC9282

Prerequisite: Recommended - Introduction to Furniture Making

The Construction Trades program gives you the opportunity to gain framing skills in new construction and/or additions, alterations and repairs of existing structures. Learn safety practices, the proper use of both hand and power tools, and construction math. You will have hands-on experience in framing through a variety of applications: walls and ceilings, floors, roofing, and windows and doors. Related specialized skills include drywall installation and finishing; trimwork; cabinet installation; plan/blueprint reading; and site layout. Projects start small and expand as your skills develop. The program is certified by the National Center for Construction Education & Research (NCCER). Students have the opportunity to be NCCER-certified in core curriculum and carpentry (Levels 1 & 2). Program completion prepares for transition to advanced apprenticeship levels with an NCCER Accredited Training Sponsor, or a college-level construction management program. 5 hours dual credit is available through College of DuPage. Prepares you for an apprentice exam. Earns college credit.

Heating, Ventilation, Air Conditioning, and Refrigeration (HVACR)

Credit: 1.5 (semester)	Level: III
3.0 (Annual)	
Grade Offered: 11, 12	Annual TC9110
	Fall TC9111
	Spring TC9112

Prerequisite: None

If you like a variety of new challenges every day, explore the opportunities for technicians in HVACR. Skilled HVACR technicians are required for residential construction, industrial equipment service, and building management. Learn the mechanical and electrical fundamentals needed to become a heating, ventilating, air conditioning and refrigeration technician, along with the electronic skills that prepare you for a post-secondary training program. Students learn installation, maintenance, diagnosis, and repair of residential forced air heating systems, hydronic heating systems, electric furnaces, oil burners, heat pumps, and air conditioning systems. Sheet metal work and light commercial HVAC equipment are included in the second year of the program. Advanced skills include sheet metal work and light commercial HVAC equipment, and the opportunity to earn EPA 608 refrigerant certification. 6 hours dual credit is available through College of DuPage; articulated credit through Northwestern College. Earns college credit.

Horticulture/Power Equipment Technology

Credit: 1.5 (Semester)
3.0 (Annual)

Level: III

Grade Offered: 11, 12

Annual	TC9330
Fall	TC9331
Spring	TC9332

Prerequisite: None

The horticulture industry needs all types of people: designers, scientists, environmental engineers, managers, technicians, and food producers. You will start with an introduction to horticulture, where you will learn how plants grow through hands-on experiences at TCD's 13-acre campus, greenhouse, and nursery. Explore the careers available in this dynamic industry then choose a curriculum emphasis: Landscape Design, Installation & Maintenance, Nursery/Greenhouse Management, or Power Equipment Technology. Put your knowledge and creativity to work creating drawings by hand and with the latest DynaScape CAD software and creating 3D computer-generated models with Google SketchUP. Exercise your leadership skills by supervising installation and maintenance crews or overseeing the management of existing landscapes. Discover how plants and food are produced on a large scale or through innovations like TCD's tilapia aquaculture lab. Internships and job placement with a business partner will give you real life experiences.

Students have the opportunity to earn certification in pesticide application and 2-cycle engines; 17 hours of dual credit is available through College of DuPage. Earns college credit.

Residential Wiring and Home Technology Integration

Credit: 1.5 (semester)
3.0 (Annual)

Level: III

Grade Offered: 11, 12

Annual	TC9010
Fall	TC9011
Spring	TC9012

Prerequisite: None

The Residential Wiring course begins with the fundamentals of electricity, low voltage wiring, high voltage wiring, network wiring, and system planning as well as rough in, trim out, and retrofitting. The wiring needs in today's homes go beyond the conventional use of electricity. Home Technology Integration is the installation and troubleshooting of several interconnected sub-systems within a home. Advanced topics include digital signal theory, HIT system components, cabling, conduit installation and bending, system troubleshooting, planning and testing. Many companies are seeking trained and certified HT1 technicians as modern homes move into networked environments. Earns college credit.

ARTS, A-V TECHNOLOGY & COMMUNICATIONS

Multimedia & Television Production

Credit: 1.5 (Semester)
3.0 (Annual)

Level: III

Grade Offered: 11, 12

Annual	TC9480
Fall	TC9481
Spring	TC9482

Prerequisite: Recommended - 1 semester of Keyboarding or Keyboarding Proficiency Test

Go behind the scenes in the multi-billion dollar entertainment industry, from local news to commercials to webcasts. Skills include computer editing using Final Cut Pro and AVID; digital video and audio; multi-track recording; set design; script writing and story boarding; studio and remote lighting; video graphics; and animation. Work as part of a production team in TCD's private HD television studio, rotating jobs such as floor director, camera operator, lighting director, and control booth team. 9 hours dual college credit through College of DuPage. Earns college credit.

BUSINESS & ADMINISTRATION

Data Entry Occupations

Credit: 1.5 (Semester)
3.0 (Annual)

Level: III

Grade Offered: 11, 12

Annual	TC9060
Fall	TC9061
Spring	TC9062

Prerequisite: 1 semester of Keyboarding or Keyboarding Proficiency Test

In Data Entry Occupations, instruction will be offered in the following areas:

- Basic database and spreadsheets
- Storing and retrieving files
- Editing source documents and proofreading
- Basic business principles, including payroll, billing, and general recordkeeping
- Word processing and document formatting

Students have the opportunity to be certified as a Microsoft Office Specialist (MOS) and earn dual credit through College of DuPage. Earns college credit.

Office Systems Technology

Credit: 1.5 (Semester)	Level: III	
3.0 (Annual)		
Grade Offered: 11, 12	Annual	TC9520
	Fall	TC9521
	Spring	TC9522

Prerequisite: Recommended - 1 semester of Keyboarding or Keyboarding Proficiency Test

Students in Office System Technology will learn basic and advanced office skills including:

- Advanced word processing
- Spreadsheet and database management
- Office technology
- Administrative procedures
- Time management
- Phone and email systems

In addition to preparing for today's highly automated workplace, lay the foundation for the necessary skills to be a Virtual Assistant, working at home through the Internet, email, phone, and FTP. Students can also be certified as a Microsoft Office Specialist (MOS) and earn 5 hours dual credit through College of DuPage. Earns college credit.

EDUCATION & TRAINING

Early Childhood Education and Care

Credit: 1.5 (semester)	Level: III	
3.0 (Annual)		
Grade Offered: 11, 12	Annual	TC9210
	Fall	TC9211
	Spring	TC9212

Prerequisite: Child Development

Successful completion of this program gives the student the skills necessary to seek employment as a child care assistant or continue their education at the college level for lead preschool teacher or elementary education teacher. Students will have the opportunity to learn to: prepare developmentally appropriate activities for preschool children; implement activities in TCD's laboratory preschool for 3 to 5 year olds; understand the basic emotional, social, intellectual and physical development of the preschool child; and participate in extended campus work experiences. Students may prepare for the Child Development Associate (CDA) credential and earn 4 hours dual credit with the College of DuPage. TCD was the first DuPage high school to offer early childhood program that offers the Level 1 Early Care & Education (ECE) Credential through INCCRRA (Illinois Network of Child Care Resource & Referral Agencies). After graduation from high school, the credentialed student qualifies for a scholarship to pursue

an ECE associate's degree at a community college. This financial aid can continue for further post-secondary education; find more information at this program's webpage, www.tcdupage.org. Earns college credit.

HEALTH SCIENCE/PUBLIC SAFETY

Certified Nursing Assistant

Credit: 1.5 (Semester)	Level: III	
3.0 (Annual)		
Grade Offered: 11, 12	Annual	TC9120
	Fall	TC9121
	Spring	TC9122

Prerequisite: Recommended - 1 semester of Keyboarding or Keyboarding Proficiency Test

This is a Basic Nurse Assistant Training Program approved by the Illinois Department of Public Health. If you're a junior or senior determined to succeed, you can meet the state requirements, including a clinical experience, for certification in one year. Learn about caring for patients; reporting observations; and understanding body systems, the nature of disease, and common health problems. Master the medical terms and communication skills critical to an effective healthcare environment. You will learn how to safely move, lift, and transport patients; measure and record vital signs; perform personal care and technical skills; and respond to a variety of patient conditions. Your acquired knowledge of basic healthcare skills, even if you do not achieve certification, will prepare you to work in assisted living facilities as well as private duty home care.

Certification Eligibility: You are eligible to take the state competency exam if you successfully complete the program and meet IDPH certification criteria, including mandatory Saturday or after school clinical sessions, and possession of a valid Social Security number. See the program webpage for more eligibility requirements. Upon passing the state exam, you will be certified as a Nursing Assistant (CNA), enabling you to seek employment in long-term care facilities, agency home care, hospitals, or other healthcare facilities. After high school graduation, you may also apply to a nursing degree program. 7 hours dual credit is available through College of DuPage. Prepares you for a certification exam. Optional courses available at additional fees. Earns college credit.

Criminal Justice

Credit: 1.5 (Semester) 3.0 (Annual)	Level: III	
Grade Offered: 11, 12	Annual	TC9070
	Fall	TC9071
	Spring	TC9072
Prerequisite: None		

This program lays the foundation for students interested in pursuing a career in law enforcement, criminal law, corrections, homeland security, investigative services, forensics, and related public safety career pathways. Cover the basics of traffic law/traffic enforcement; juvenile and criminal law; crime prevention; the court and corrections systems; and more. Develop your observational, communication, documentation, and “people” skills critical for success in this field. You will also learn which career paths require further training or education. The program includes simulations, demonstrations, report preparation, lectures, field trips and work-based learning experiences. Viewing the criminal justice system from the ground up will help you understand how these career pathways play out at the local, private, state, and federal levels of service. Students will also receive Citizens Emergency Response Training (and possible certification) through the Addison Police Department. 1 hour of dual credit is available through College of DuPage. Earns college credit.

Fire Science

Credit: 1.5 (Semester) 3.0 (Annual)	Level: III	
Grade Offered: 11,12	Annual	TC9260
	Fall	TC9261
	Spring	TC9262

Prerequisite: Earned credits for junior standing

This program follows the standards of training in NFPA 1001 (National Fire Protection Association) Standard for Firefighters, and Emergency Medical Technician (EMT) National Standards. After age 18, you could become an EMT -- and be on the road to future Firefighter Basic certification, after age 21.

The Fire Science program includes safety and hazardous materials recognition; fire behavior; rescue/extrication techniques (including use of the “jaws of life”); communications; and equipment use and maintenance. Emergency medical training includes Emergency Medical Responder (EMR), Emergency Medical Technician (EMT), and Healthcare Provider CPR. You must meet the necessary age (at least 18 years old), state, and industry requirements in order to challenge the state or national EMT licensing exam. Visit the Fire Science page at www.tcdupage.org for more detailed EMT exam requirements. 22 hours of dual credit is available through College of DuPage. Prepares you for a certification exam. Earns college credit.

Medical & Health Care Careers

Credit: 1.5 (Semester) 3.0 (Annual)	Level: III	
Grade Offered: 11, 12	Annual	TC9080
	Fall	TC9081
	Spring	TC9082

Prerequisite: Recommended - 1 year of Chemistry and 1 semester of Keyboarding or Keyboarding Proficiency Test

Admission to college healthcare programs (i.e. medical assisting, nursing, radiology, surgical technology, occupational or physical therapy, and many others) is very competitive. Many colleges require a biomedical terminology course as a prerequisite to admission to such programs. With an opportunity to earn dual credit for a comprehensive biomedical terminology course and overview of health science pathways and careers, this program can be your head start.

You will learn extensive biomedical terminology as it relates to each body system and to healthcare careers and medical specialties. Classes are taught by a licensed registered nurse, and guest speakers may include other healthcare professionals. You will use and apply your knowledge through a combination of interactive hands-on activities; (dissection, specimen analysis, dental impressions, etc.); medical reports and case studies; word games; and multimedia activities. Along the way, you may also learn basic healthcare skills such as CPR and infection control practices. In addition to strengthening science and language arts skills through anatomy and medical terminology, you will explore select medical math topics and learn job-seeking skills. 8 hours of dual credit is available through College of DuPage. Earns college credit

HOSPITALITY/HUMAN SERVICES

Cosmetology

Credit: 1.5 (semester) 3.0 (Annual)	Level: III
Grade Offered: 11, 12	Annual TC9200 Fall TC9201 Spring TC9202

Prerequisite: Recommended - 1 semester of any Art course; Fashion and Interior Design; and/or 1 semester of Psychology

TCD operates a state licensed School of Cosmetology. Upon successful completion of 1500 clock hours of work and passing TCD's practical exam, a student qualifies to take the state license examination. This rigorous curriculum includes haircutting, styling, coloring, permanents, nail technology, esthetics, and the application of cosmetics, as well as anatomy/physiology; skin, scalp, and nail diseases; and understanding chemical processes. Curriculum includes haircutting, styling, coloring, permanents, nail technology, esthetics, and the application of cosmetics. Application of these skills is accomplished through TCD's "Salon 301" (open to the public), internships, and other program-sponsored activities. It is possible to earn up to 46 hours of dual credit through College of DuPage, leaving only the completion of general education requirements to obtain an associate's degree after graduation.

Prepares you for a license exam. Earns college credit

Culinary, Pastry Arts, & Hospitality Management

Credit: 1.5 (semester) 3.0 (Annual)	Level: III
Grade Offered: 11, 12	Annual TC9360 Fall TC9361 Spring TC9362

Prerequisite: Foods and Nutrition

This is a certified National Restaurant Association ProStart program and the only Illinois high school culinary program certified by the American Culinary Federation Education Foundation (ACFEF). Students have the opportunity to earn the following certifications:

- ACF Junior Culinarian
- ACF Secondary Graduate
- ProStart National Certificate of Achievement (Illinois Restaurant Assn.)
- First Aid and CPR (American Heart Association)
- Wisconsin Mike Marketing Cheesecyclopedia Certificate

Classes are taught by industry professionals and well-supported by top business partners. First year students complete safety and core skills before rotating through culinary arts, pastry arts, and hospitality management. During the second year, students develop supervisory

and administrative techniques including purchasing, inventory control, daily cash deposits, and invoice payment authorizations. Sustainable, "green" practices are also part of the curriculum. Students apply their skills on-site through TCD's Bistro 301, the TCD Deli, and the Gateway Café. Internships and special projects also provide hands-on, work-based experiences. Students are prepared for post-secondary training and college-level work; credit or advanced standing is available upon enrollment in various colleges and culinary schools, including College of DuPage, Johnson & Wales University, Triton College, Harper College, Kendall College, and the Cooking & Hospitality Institute of Chicago (CHIC).

Dual and articulated college credit is available through this program.

Students also have the opportunity to enroll in College of DuPage for an after school class that prepares them for the Applied Food Service Sanitation Certificate. Successful completion of this class (75% accuracy) entitles a student to receive the State of Illinois Department of Public Health Sanitation License. This class requires the purchase of extra books and testing materials. This is a college credit class. Prepares you for a sanitation license. Earns college credit.

INFORMATION TECHNOLOGY

Computer Information Systems & Game Design

Credit: 1.5 (semester) 3.0 (Annual)	Level: III
Grade Offered: 11, 12	Annual TC9040 Fall TC9041 Spring TC9042

Prerequisite: 1 semester of keyboarding

Students have an opportunity to learn a wide variety of computer technology skills for both gaming and business applications. Activities include:

- Installing and developing software
- Writing and debugging programs
- Learning C++, C#, Visual Basic, HTML, Java, XNA (for Xbox), and other languages
- Game programming, including program coding, 3D character design, storyboarding
- Developing professional websites using the Adobe Creative Suite
- Using AutoDesk 3ds Max Design and Maya

Students may prepare for C++ certification (through CompTIA) and the AutoDesk Certified Associate Exam. Upon completion, students are ready for help desk and entry-level programming, as well as prepared for college level coursework. Articulated credit is available upon enrollment at the College of DuPage or the Illinois Institute of Art. 3 hours of dual credit through College of DuPage; articulated college credit through the Illinois Institute of Art.

SCIENCE, TECHNOLOGY, ENGINEERING & MATHEMATICS

Electronics Technology

Credit: 1.5 (semester) 3.0 (Annual)	Level: III
Grade Offered: 11, 12	Annual TC9240 Fall TC9241 Spring TC9242

Prerequisite: None

Learn to install, customize, repair, maintain, or even improve today's cutting edge electronics technology. First learn speak and read the language of electronics: symbols, data sheets, safety measures, and diagrams. Then begin electronic fabrication: the art of soldering, using assembly tools, and system testing procedures. Build, test, and troubleshoot circuits, using a digital storage oscilloscope to convert, observe, and record constantly varying signal voltages. Understand the fundamentals of transformers, capacitors, inductors, and DC circuits. Projects you can tackle include designing and building a 14 watt RMS stereo amplified system, configuring PC networks, exploring alternative energy generation (solar, wind), and using motor controls, PLCs, and robotics to design your own mini-automated system. You have the opportunity to earn up to 14 hours of dual credit and an Electronics Technology certificate 4905 through an agreement with College of DuPage.

Pathway to Engineering

Credit: 1.5 (Semester) 3.0 (Annual)	Level: III
Grade Offered: 11, 12	Annual TC9190 Fall TC9191 Spring TC9192

Prerequisite: CAD (Drafting) or CAD Technology

Combine your natural design talents and problem-solving ability with in-demand technical skills as you explore the creative world of engineers, architects, manufacturers, and design technicians. TCD's hands-on learning labs and industry standard technology are the perfect fit for this challenging curriculum developed by nationally acclaimed Project Lead The Way (PLTW), an innovative leader in STEM education (www.pltw.org). TCD is a PLTW Certified School, offering the "Pathway to Engineering" in semester-long courses: two foundational courses, a choice of specialized courses, and a capstone semester-long course. Through "Pathway to Engineering," students may earn preferential enrollment and/or credit through PLTW university affiliates.

- **Introduction to Engineering Design** (foundation course): Discover the role of an engineer in taking an idea from the design process to manufacturing or

production, using Inventor, state-of-the-art 3D design software from AutoDesk. Produce a working prototype of your project with a state-of-the-art 3D printer.

- **Principles of Engineering** (foundation course) -- Master the basic concepts needed to continue your education in engineering or engineering technology. Apply those concepts to real world challenges: energy sources, machine systems, fluid power, materials testing, and more. Team up with other students to test your problem-solving skills through projects or presentations.

- **Biotechnical Engineering** (specialized course) – Imagine developing a drought-resistant crop for a nation facing famine – a cheaper and more efficient biofuel – designing a limb replacement allowing a patient to snowboard again. Learn how engineers apply biological and engineering concepts to design materials and processes that directly measure, repair, improve, and extend living systems. Hands-on projects engage you in engineering design problems related to biomechanics, cardiovascular engineering, genetic engineering, tissue engineering, biomedical devices, forensics, and bioethics. You will explore the diverse fields of biotechnology including biomedical engineering, molecular genetics, bioprocess engineering, and agricultural and environmental engineering.

- **Civil Engineering and Architecture** (specialized course) -- Use 3D modeling software to create and test your own residential and commercial designs, factoring in materials, structural design, cost analysis, storm water management, site design, utilities and services, building codes, and architectural style and guidelines. Research new developments in energy, green technologies, and changing populations.

- **Computer Integrated Manufacturing** (specialized course) The U.S. is still a world leader in precision manufacturing and innovation. Today's manufacturing is complex and high-tech, requiring problem-solvers with good STEM skills (Science, Technology, Engineering, Mathematics). In this course, learn how are things made, and how are assembly lines are designed and automated. Students will design and build their own automated manufacturing systems, factoring in safety, quality, cost, and efficiency. Technologies used include computer modeling, Computer Numeric Control (CNC), Computer Aided Manufacturing (CAM) software, and flexible manufacturing systems.

- **Digital Electronics** (specialized course)-- Analyze, design, and build your own digital electronic circuits, the technology that powers your cell phone, MP3 player, laptops, tablets, and cameras. The demand for greater signal speed, storage capacity, and applications drives industry's need for creative problem-solvers and innovators. Start with the basics: theory, technical documentation, analog electronics, terminology, communication methods, engineering standards, and troubleshooting techniques.

Learn the process of combinational and sequential logic design and the role of robotics and industrial motors in today's complex automated systems. Before you know it, you will be programming microchips, a basic stamp microcontroller, and Boe-Bots.

- **Aerospace Engineering** (specialized course) -- Explore the evolution of flight, navigation and control, flight fundamentals, space travel, and orbital mechanics. Could you design a satellite to clean up space junk orbiting the earth? What does it take to control and maintain a rover on a distant planet? Learn to analyze, design, and build your own aerospace systems, using 3D visualization software and cutting edge aerospace analysis software used in the industry. By tackling projects like airfoil design, planetary rover building, and space, defense and intelligence applications, you will acquire skills that allow you to touch and impact the future. In addition, this course presents alternative applications for aerospace engineering concepts.

- **Engineering Design & Development** (capstone course) -- This is a final project; work as part of a team to research, design, test, and construct a solution to a technical problem of your choosing.

- Supplies: See TCD website
- Earns college credit.

MANUFACTURING & TRANSPORTATION

Auto Body Repair & Refinishing

Credit: 1.5 (Semester)	Level: III
3.0 (Annual)	
Grade Offered: 11, 12	Annual TC9160
	Fall TC9161
	Spring TC9162

Prerequisite: None

The program teaches all facets of collision repair, including basic sheet metal and welding techniques. Other areas include body alignment equipment; finishing and painting; cost/time estimating; plastics; fiberglass; measuring systems; and shop management. Students have the opportunity earn Gold Class points toward I-CAR certifications. 12 hours of dual credit through Kishwaukee Community College; Articulated credit is available through Highland College and Nashville Auto-Diesel. Earns college credit.

Automotive Technology

Credit: 1.5 (Semester)	Level: III
3.0 (Annual)	
Grade Offered: 11, 12	Annual TC9170
	Fall TC9171
	Spring TC9172

Prerequisite: A or B in Auto Mechanics

ASE-certified instructors help you build fundamental and advanced skills in computerized engine controls; engine tune-up and lubrication; brakes; electrical, fuel, cooling, and exhaust systems; and wheels, steering, and alignment. Second year students develop skills in diagnostics transmissions, and engine building. You can test for ASE certification in air conditioning and earn 8 hours of dual college credit through College of DuPage or articulated college credit is available through several colleges and technical schools. Earns college credit.

Manufacturing Technology

Credit: 1.5 (Semester)	Level: III
3.0 (Annual)	
Grade Offered: 11, 12	Annual TC9140
	Fall TC9141
	Spring TC9142

Prerequisite: None

As an entire generation retires, U.S. manufacturing is facing a shortage of highly skilled drafters, designers, CNC (computer numerically controlled) programmers, and technicians – especially in the Chicago area according to a recent UIC study. Become part of the solution in a field that offers better pay (\$67K average in the Chicago area) and benefits than non-manufacturing jobs. First learn how computer controlled systems drive the manufacturing of a variety of industrial and commercial products. Understand the critical role of math and physics concepts in precision manufacturing: measuring, tolerances, metallurgy, and data analysis. Learn to read blueprints and schematics, use industry software like CAD and CAM, and how to use calipers, micrometers, scanners, and robotic systems. Best of all, you will run huge systems and make actual products you designed. Whether you continue your education through certification, apprenticeship, or associate's degree, there are opportunities waiting for your developed skills.

DUAL CREDIT

TCD PROGRAM	COD PROGRAM	NO. OF HOURS	TERM
Automotive Technology	Auto 1110 (2nd Year)	4	Spring
	Auto Tech 1140 (2nd Year)	4	Spring
Certified Nurse Assistant	HS 1150 (CPR)	1	Fall
	HS 1105 - Nurse Assistant	6	Fall/Spring
Computer Info Systems	CIS 1150 - Intro to Comp. Info Systems	3	Spring
Construction	ARCH 1141 - Construction Methods I	2	Spring
	ARCH 2142 - Construction Methods II	2	Spring
Cosmetology	Cosme 1101	2	Fall
	Cosme 1103	3	Fall
	Cosme 1105	3	Fall
	Cosme 1107	2	Fall
	Cosme 1111	2	Spring
	Cosme 1113	3	Spring
	Cosme 1115	3	Spring
	Cosme 1117	2	Spring
	Cosme 1120	2	Summer
	Cosme 2201	3	Spring
	Cosme 2203	3	Spring
	Cosme 2205	2	Spring
	Cosme 2207	2	Spring
	Cosme 2221	2	Spring
	Cosme 2223	3	Spring
	Cosme 2225	3	Spring
	Cosme 2227	2	Spring
	Cosme 2250	2	Spring
	Cosme 2253	2	Spring
Early Childhood Education	ECEC 1100 - Intro to Early Childhood	3	Fall/Spring
Electronics & Pre-Engineering Technology	ET 1100 - Electricity & Electronics	2	Fall/Spring
	ET 1120 - Electronic Documentation	2	Spring
	ET 1130 - Electrical Materials & Fabrication	2	Fall/Spring
	(1st & 2nd year only) ET 1141 - Digital Fundamentals	3	Spring
	(2nd year only) ELMEC 1101 - Survey of Automation	2	Spring
	CIT 1100 - PC Maintenance & Upgrading	2	Fall
	CIT 1111 - Computer Hardware Maint.	3	Spring
Fire Science	Fire 1110 - Intro to Fire Science	3	Fall
	Fire 1150 - CPR	1	Spring
	Fire 2230 - Hazardous Materials	3	Fall
	Fire 2271 - EMT - Basic	8	Spring
	Fire 2283 - First Responder	3	Fall
	Phys 1820 - Selected Topics/First Aid	.5 - 3	Spring

DUAL CREDIT

TCD PROGRAM	COD PROGRAM	NO. OF HOURS	TERM
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HVAC	Airc 1105 - Intro to Safety, Materials & Equipment	3	Spring
	Airc 1108 - Refrigerant Certification	1	Spring
	Airc 1161 - Intro to Sheet Metal	2	Spring

Landscape Design	Hort 1100 - Intro to Horticulture	3	Fall/Spring
	Hort 1112 - Landscape Maint. & Constr.	3	Fall/Spring
	Hort 2211 - DynaSCAPE Design	3	Fall/Spring
	Hort 2212 - DynaSCAPE Design II	3	Fall/Spring
	Hort 1821 - 4 cycle small engine repair	3	Fall/Spring
	Hort 1824 - 2 cycle small engine repair	2	Fall/Spring

Medical and Health Care Careers	HS 1150 (CPR)	1	Fall
	HS 1100 - Survey of Health Careers	2	Spring
	HS 1110 - Biomedical Terminology	4	Spring
	Phys 1820 - Selected Topics/First Aid	.5 - 3	Fall

Multi Media	(1st year only) MPT 1011 - Intro to Motion Picture/TV	3	Fall/Spring
	MPT 1020 - Editing Motion Picture/TV	3	Spring
	MPT 1220 - Intro to TV Production	3	Spring

Office Systems	OTI 1100 - Intro to Keyboarding	2	Spring
	OTI 1210 - Word Processing I	3	Spring